

Industrial Automation



Presented by:
Future Design Engineers
Innovation in design....

What is Automation

“Automation is basically the technique of making an apparatus, a process, or a system operate automatically.”

- *As the name suggest “Automation” means to perform automatic operations of different kinds of machines.*
- *The creation and application of technology to monitor and control the production and delivery of products and services*
- *Automation generally implies the integration of machines into a self-governing system*

Reasons for Automation

1. *Shortage of labor*
2. *High cost of labor*
3. *Increased productivity*
4. *Competition*
5. *Safety*
6. *Reducing manufacturing lead time*
7. *Lower costs in the long run*
8. *To accomplish what cannot be done manually*

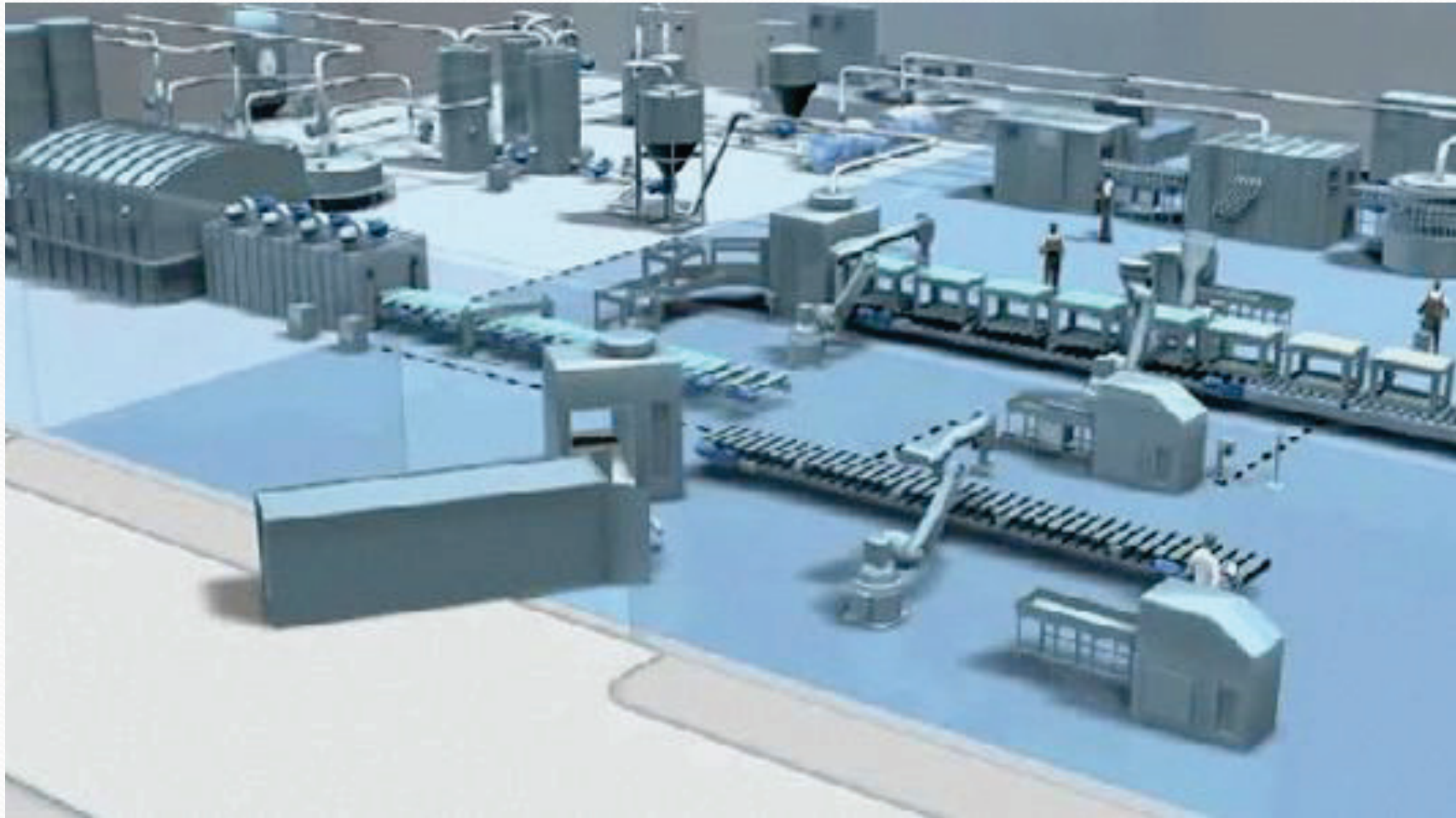


Benefits of Automation

- *The biggest benefit of automation is that it saves labor, save energy and materials and to improve quality, accuracy and precision.*
- *Automation is basically the delegation of human control functions technical equipment aimed towards achieving.*
- *Higher Productivity.*
- *Superior quality end product.*
- *Efficient usage of energy and raw material.*
- *Improved safety in working conditions etc.*



Example :- Use of Automation



Combined Operation(P&G)

Area of Automation Application

- *INDUSTRIAL*
- *WASTE MANAGEMENT*
- *HIGHWAY SYSTEM*
- *VIDEO SURVILLANCE*
- *MINING*
- *STORAGE*
- *FOUNDRY*
- *FOOD & BREWERY*

Industrial Automation



Industrial automation is the use of robotic devices to complete manufacturing tasks. it is important in the manufacturing process because computerized or robotic machines are capable of handling repetitive tasks quickly and efficiently.



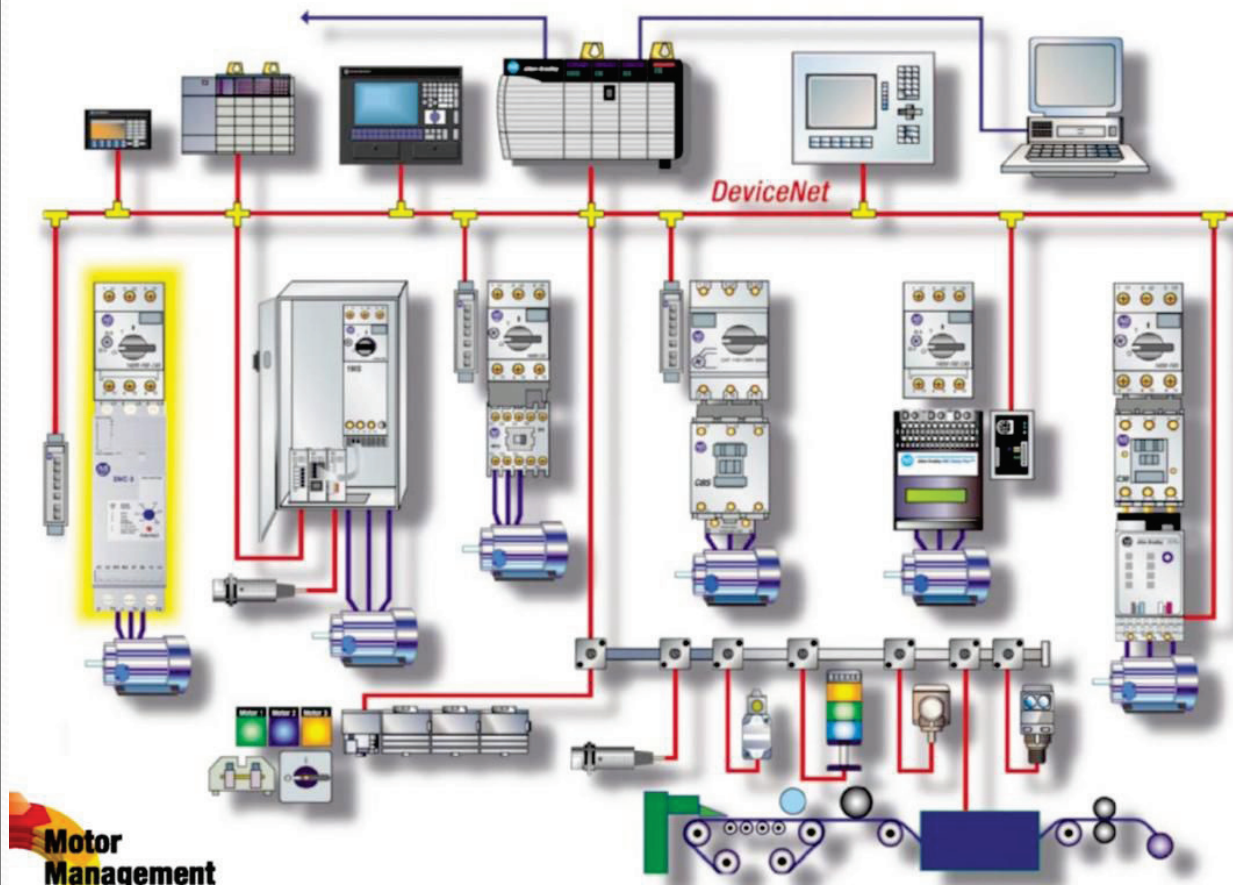
Tools for Automation

- *Programmable Logic Controller (PLC)*
- *Supervisory Control And Data Acquisition (SCADA)*
- *Human Machine Interface (HMI) or Touch Screen (TS)*
- *Variable Frequency Drive (VFD)*



Automation
Tools

PLC(PROGRAMABLE LOGIC CONTROL)



- *The Automation of many different process such as controlling machines or factory assembly lines is done through the use of small computers called a programmable logic controller (PLCs)*

- *Computers*
- *Controllers*
 - *Actuators*
 - *Sensors*
- *Software*

SCADA(Supervisory Control and Data Acquisition)



It is impossible to keep control and supervision on all industrial activities manually.

Some automated tool is required. A unique solution is SCADA

It is an industrial control system where a computer system monitoring and controlling a process.

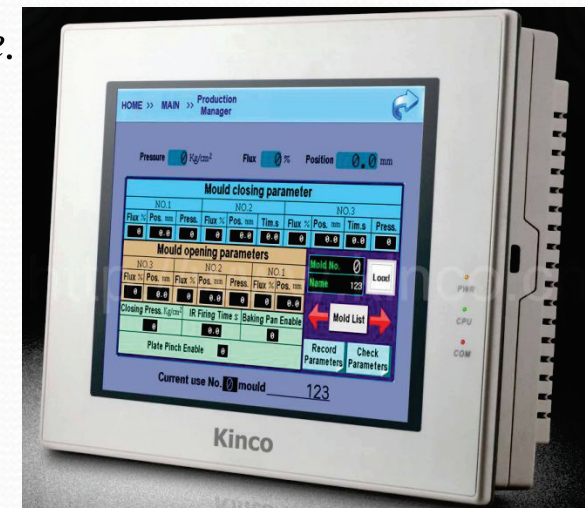
HUMAN MACHINE INTERFACE (HMI)



- *A human machine interface (HMI) is an interface which permits interaction between a human being and a machine.*

- *The user interface in a manufacturing or process control system. It provides a graphics-based visualization of an industrial control and monitoring system.*

- *Two components are needed in a human machine interface. The first is an input. A human user needs some way to tell the machine what to do, to make requests of the machine, or to adjust the machine. Examples of input devices include keyboards, toggles, switches, touch screens,*



Variable Frequency Drive (VFD)

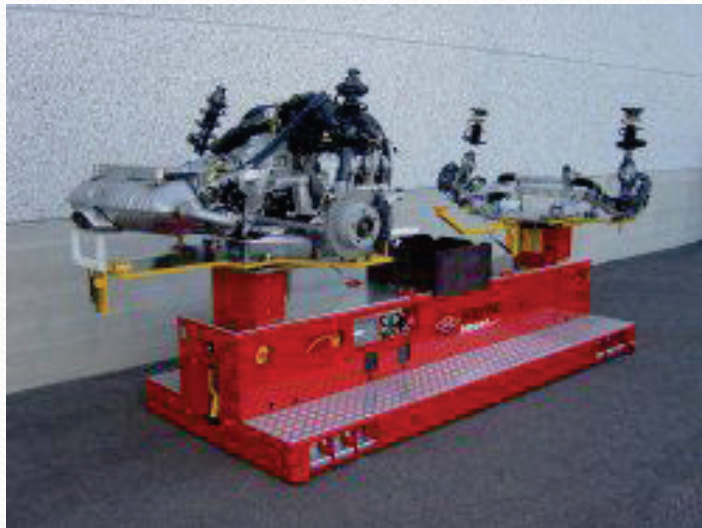
- *A VFD can be used to control both the speed and torque of a standard induction AC electric motor.*
- *It varies both the frequency and amps of the AC waveform being delivered to the motor saving money in electricity.*
- *Standard motors are constant speed and when they are energized they run at a 100% no matter the load.*
- *Soft Start*
- *Only use energy you need*



Robots in Industry Automation



← →
Material Handling



→
Material Storage

←
AGV: Automated
Guided Vehicle



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